IN THE CLAIMS:

Cancel claims 1, 2, and 3.

Amend claim 11 by changing paragraph D), second version, to paragraph E) and by changing paragraph E) to paragraph F).

Amend claim 19 by changing "duagl-use" to --dual-use-- in line 2 of paragraph C).

Amend claim 23 by deleting "-*0-" in line 3 of subparagraph 1) of paragraph A) therein. These changes are shown in the following amended version of claims 1-23:

Amended version of claims 1-23:

1. (canceled) A jet recirculation pump having dual-use inflows for wastewater treatment, whereby a higher nitrate recycle rate than is typically used is available for either an MLE process or a Bio-P process without incurring higher operating costs for electric power and higher capital costs for larger pumps and piping.

2. (canceled) The jet recirculation pump of claim 1, wherein each of said dual-use inflows is controllable.

3. (canceled) The jet recirculation pump of claim 2, wherein said each of said dual-use inflows is capable of being monitored as to the amount thereof.

4. (original) A wastewater treatment process for deep tanks operated in a series that comprises an initial tank containing mixed liquor which receives a stream of throughput wastewater flowing at an input rate and a downstream tank which discharges into a clarifier, comprising the dual use of a jet recirculation pump, which is flow connected to said initial tank and to said downstream tank, to provide selectively both:

A) backward recycling, with said dual-use jet recirculation pump, of at least 100% of said input rate from said downstream tank to a jet manifold, disposed within said initial tank, that mixes the contents of said initial tank; and

B) pumping said mixed liquor from said initial tank to said jet manifold with said dual-use jet recirculation pump,

whereby higher operating costs for electric power and higher capital costs for larger pumps and piping are avoided.

5. (original) The process of claim 4, wherein:

A) said initial tank is operated as an Anoxic Reactor and said downstream tank is operated as a Aerobic Reactor; and

B) said process is a two-stage activated sludge process, conventionally termed a Modified Ludzak Ettenger Process, for:

1) fermenting proteins in said wastewater to liberate ammonia and removing carbonaceous Biological Oxygen Demand by biological synthesis while said wastewater is within said Anoxic Reactor,

2) oxidizing said ammonia to form nitrate ions while said wastewater is within said Aerobic Reactor, and

3) reducing said nitrate ions to form nitrogen gas while said wastewater is within said Anoxic Reactor, whereby substantial denitrification of said throughput wastewater occurs.

6. (original) The process of claim 5, wherein:

A) said backward recycling from said Aerobic Reactor to said Anoxic Reactor is 4 to more than 8 times said input rate; and B) said mixed liquor discharges from said Anoxic Reactor to said Aerobic Reactor, said discharging being from 5 to more than 9 times said input rate.

7. (original) The process of claim 6, wherein:

A) said mixed liquor discharges from said Aerobic Reactor to

said clarifier at from 1.5 to 3 times said input rate; and

B) said clarifier discharges clarified liquor and sludge, a portion of said sludge being recycled to said Aerobic Reactor at 0.5 to 2 times said input rate.

8. (original) The process of claim 6, wherein:

A) said mixed liquor discharges from said Aerobic Reactor to said clarifier at from 1.5 to 3 times said input rate; and

B) said clarifier discharges clarified liquor and sludge, a portion of said sludge being recycled to said Anoxic Reactor at 0.5 to 2 times said input rate.

9. (original) The process of claim 8, wherein a nitrate-rich recycle flow rate from said Aerobic Reactor to said Anoxic Reactor equal to 400 percent to 800 percent of said input rate is utilized in combination with said return of activated sludge from said clarifier to said Anoxic Reactor, resulting in a nitrate removal efficiency of 82 to 91 percent without consuming additional energy for operation of a separate nitrate recycle pump or pumps.

10. (original) The process of claim 4, wherein:

A) said initial tank is operated as an Anaerobic Reactor, said downstream tank is operated as an Anoxic Reactor, and a final tank, disposed downstream of said Anoxic Reactor, is operated as an Aerobic Reactor;

B) said process is a three-stage activated sludge process for treating wastewater, conventionally termed a Biological Phosphorus Process;

C) said Anaerobic Reactor has a jet manifold, disposed at its bottom for mixing the contents thereof, and a dual-use jet recirculation pump which is flow connected to said Anaerobic Reactor for withdrawing selected amounts of mixed liquor therefrom and is also flow connected to said Anoxic Reactor for withdrawing selected amounts of mixed liquor therefrom and is additionally flow connected to said jet manifold within said Anaerobic Reactor for feeding said withdrawn mixed liquors thereto;

D) said Anoxic Reactor has a jet manifold, disposed at its bottom for mixing the contents thereof, and a dual-use jet recirculation pump which is flow connected to said Anoxic Reactor for withdrawing selected amounts of mixed liquor therefrom and is also flow connected to said Aerobic Reactor for withdrawing selected amounts of mixed liquor therefrom and is additionally flow connected to said jet manifold within said Anoxic Reactor for feeding said withdrawn mixed liquors thereto; and

E) said Aerobic Reactor has a jet manifold, disposed at its bottom for mixing the contents thereof, and a recirculation pump which is flow connected to said Aerobic Reactor for withdrawing selected amounts of mixed liquor therefrom and is also flow connected to said jet manifold within said Aerobic Reactor for feeding said withdrawn mixed liquor thereto.

11. (currently amended) The process of claim 10, wherein:

A) said withdrawing of nitrate-poor mixed liquor from said Anoxic Reactor to said Anaerobic Reactor by said dual-use jet recirculation pump is from one to more than two times said input rate, enabling phosphorus-storing (polyP) bacteria in said Anaerobic Reactor to hydrolyze adenosine triphosphate and release energy that is utilized to polymerize Volatile Fatty Acids present in said wastewater and additional Volatile Fatty Acids liberated by fermentation of proteins to form a substrate of organic compounds that are stored intracellularly by said polyP bacteria;

B) said mixed liquor discharges from said Anaerobic Reactor to said Anoxic Reactor at 2 to more than 3 times said input rate;

C) said withdrawing of nitrate-rich mixed liquor from said Aerobic Reactor to said Anoxic Reactor by said dual-use jet recirculation pump is from 4 to more than 8 times said input rate;

D) ammonia having also been liberated from said proteins by fermentation in said Anaerobic Reactor and in said Anoxic Reactor by the activities of several species of microorganisms, said mixed liquor discharges from said Anoxic Reactor to said Aerobic Reactor at 5.5 to more than 11 times said input rate, whereby said ammonia is then oxidized to nitrate ions in said Aerobic Reactor and said ions are finally denitrified in said Anoxic Reactor to form

nitrogen gas;

[D)]--E)-- said mixed liquor discharges from said Aerobic Reactor to a clarifier at 1.5 to 3 times said input rate, enabling said polyP bacteria to:

1) proliferate while in said Aerobic Reactor,

2) metabolize said stored intracellular compounds for growth and energy, and

3) remove large quantities of phosphate from solution with excess energy during a "luxury" uptake stage;

[E)]--F)-- said clarifier discharges sludge, a portion of said sludge being withdrawn by a flow-connected pump and fed to said Anoxic Reactor and/or to said Aerobic Reactor at a rate of from 0.5 to 2 times said input rate, and the remaining portion of said sludge being wasted, whereby:

1) large quantities of phosphorus are removed from said process in said wasted portion of said sludge, and

2) a stream of clarified liquor discharged by said clarifier contains substantially smaller quantities of both nitrogen and phosphorus as compared to said stream of throughput wastewater.

12. (original) In a process for treating a stream of wastewater being fed at an input rate to an initial deep tank of a series of deep tanks, the improvement comprising the employment of at least one dual-use jet recirculation pump, comprising:

A) withdrawing a selected amount of mixed liquor from at least said initial deep tank with said dual-use jet

recirculation pump and feeding said withdrawn mixed liquor to a jet mixing manifold, disposed within said initial deep tank, for mixing the contents thereof; and

B) withdrawing a selected amount of downstream mixed liquor from a downstream deep tank of said series of deep tanks with said dual-use jet recirculation pump and feeding said downstream mixed liquor to said jet mixing manifold.

13. (original) The process of claim 12, wherein:

A) the rate of withdrawing said mixed liquor from said downstream tank is from 4 to more than 8 times said input rate; and

B) the rate of discharge of said mixed liquor from said initial deep tank to said downstream deep tank is from 5 to more than 9 times said input rate.

14. (original) The process of claim 13, wherein:

A) said downstream deep tank discharges to a clarifier at a rate of 1.5 to 3 times said input rate; and

B) a pump withdraws return sludge from said clarifier at a rate of 0.5 to 2 times said input rate and feeds a selected portion of said return sludge to said downstream deep tank and/or said initial deep tank, whereby ammonia formed by fermentation of proteins in said inflowing wastewater is oxidized to form nitrate ions while in said downstream tank and said nitrate ions are substantially reduced to form nitrogen gas while in said initial deep tank.

15. (original) The process of claim 12, wherein:

A) said series of deep tanks comprises said initial tank, said downstream tank, and a final tank;

B) said initial tank functions as an Anaerobic Reactor, said downstream tank functions as an Anoxic Reactor, and said final tank functions as an Aerobic Reactor; and

C) said Anaerobic Reactor has a jet manifold, disposed at its bottom for mixing the contents thereof, and a dual-use jet recirculation pump which is flow connected to said Anaerobic Reactor for withdrawing selected amounts of mixed liquor therefrom and is also flow connected to said Anoxic Reactor for withdrawing selected amounts of nitrate-poor mixed liquor therefrom and is additionally flow connected to said jet manifold within said Anaerobic Reactor for feeding said withdrawn mixed liquors thereto;

D) said Anoxic Reactor has a jet manifold, disposed at its bottom for mixing the contents thereof, and a dual-use jet recirculation pump which is flow connected to said Anoxic Reactor for withdrawing selected amounts of mixed liquor therefrom and is also flow connected to said Aerobic Reactor for withdrawing selected amounts of mixed liquor therefrom and is additionally flow connected to said jet manifold within said Anoxic Reactor for feeding said withdrawn mixed liquors thereto; and

E) said Aerobic Reactor has a jet manifold, disposed at its bottom for mixing the contents thereof, and a recirculation pump which is flow connected to said Aerobic Reactor for

withdrawing selected amounts of mixed liquor therefrom and is also flow connected to said jet manifold within said Aerobic Reactor for feeding said withdrawn mixed liquor thereto.

16. (original) The process of claim 15, wherein:

A) said withdrawing of mixed liquor from said Anoxic Reactor by said dual-use jet recirculation pump is from one to more than 2 times said input rate;

B) said mixed liquor discharges from said Anaerobic Reactor to said Anoxic Reactor at 2 to more than 3 times said input rate;

C) said withdrawing of mixed liquor from said Aerobic Reactor to said Anoxic Reactor by said dual-use jet recirculation pump is from 4 to more than 8 times said input rate; and

D) said mixed liquor discharges from said Anoxic Reactor to said Aerobic Reactor at 5.5 to more than 11 times said input rate, said Aerobic Reactor being mixed by a jet manifold disposed therein which is fed by a recirculation pump.

17. (original) The process of claim 16, wherein:

A) said Aerobic Reactor discharges to a clarifier at a rate of 2.5 to 3 times said input rate; and

B) a pump withdraws return sludge from said clarifier and selectively feeds a portion of said return sludge to said Aerobic Reactor and/or to said Anoxic Reactor, said portion being 0.5 to 2 times said input rate, and discharges the

remaining portion as waste sludge, whereby a stream of clarified liquor discharged by said clarifier contains substantially smaller quantities of both nitrogen and phosphorus as compared to said stream of throughput wastewater and large quantities of phosphorus are removed from the process in said waste sludge.

18. (original) A continuous process for treating a stream of wastewater flowing at an input rate and containing proteins and a soluble substrate comprising soluble carbonaceous Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD), wherein said process comprises the following steps:

A) fermenting said proteins in said stream to form Volatile Fatty Acids and ammonia, oxidizing said ammonia to form nitrate ions, and reducing up to 91 percent of said nitrate ions to liberate nitrogen gas;

B) hydrolysing adenosine triphosphate (ATP) by phosphorus-storing (polyP) bacteria to release phosphate and 7.3 kcal/mol of energy per mol of ATP;

C) utilizing said released energy to polymerize a substrate of organic compounds, including said Volatile Fatty Acids as well as additional Volatile Fatty Acids and short-chain alcohols in said input wastewater, for intracellular storage as polymerized compounds;

D) metabolizing said stored intracellular compounds for proliferating said polyP bacteria and for releasing energy; and

E) removing phosphate from solution and storing excess energy in intracellular phosphate bonds during a "luxury" uptake stage, whereby said polyP bacteria may comprise up to 10 per cent by weight of phosphorus,

wherein all of said steps occur within an Anaerobic Reactor, an Anoxic Reactor, and an Aerobic Reactor which are disposed in a downstream series, each said reactor having a jet manifold disposed at the bottom thereof for mixing the contents thereof and an attached jet recirculation pump which is flow connected to said jet manifold, said jet recirculation pumps attached to said Anaerobic Reactor and to said Anoxic Reactor being dual-use pumps which are additionally flow connected to a downstream reactor.

19. (original) The process of claim 18, wherein said Aerobic Reactor discharges, at a rate of 1.5 to 3 times said input rate, to a clarifier which produces clarified liquor and sludge.

20. (original) The process of claim 19, wherein:

A) said withdrawing of mixed liquor from said Anoxic Reactor by said dual-use jet recirculation pump is from one to more than 2 times said input rate;

B) said mixed liquor discharges from said Anaerobic Reactor to said Anoxic Reactor at 2 to more than 3 times said input rate;

C) said withdrawing of mixed liquor from said Aerobic Reactor to said Anoxic Reactor by said [duagl-use] --dual-use-- jet recirculation pump is from 4 to more than 8 times said input rate; and

D) said mixed liquor discharges from said Anoxic Reactor to said Aerobic Reactor at 5.5 to more than 11 times said input rate, said Aerobic Reactor being mixed by a third jet manifold.

21. (original) The process of claim 20, wherein said clarifier discharges sludge, and a portion of said sludge is withdrawn by a flow-connected pump and fed to said Anoxic Reactor and/or to said Aerobic Reactor at a rate of from 0.5 to 2 times said input rate, thereby supplying nitrate ions to said reactors whereby said nitrate ions are substantially reduced to form nitrogen gas, causing a stream of clarified liquor discharged by said clarifier to contain substantially smaller quantities of nitrogen as compared to said stream of throughput wastewater.

22. (original) The process of claim 21, wherein a nitrate recycle rate equalling 400 percent to 800 percent of said input rate is utilized in combination with a return rate of activated sludge from said clarifier to said Anoxic Reactor equalling 0.5 to 2 times said input rate, to produce a nitrate removal efficiency of 82 to 91 percent.

23. (currently amended) The process of claim 20, wherein said Aerobic Reactor is maintained under aerobic conditions in order to:

A) enable polyP bacteria in its mixed liquor to:

1) multiply by utilizing a polymerized substrate of organic compounds stored intracellularly while [-*0-] releasing energy, and

2) ingest phosphate ions on a "luxury" uptake basis;

and

B) oxidize ammonia, which is created by deamination of proteins contained in said inflowing wastewater stream to said Anaerobic Reactor, to form nitrate ions.